

PATENT SPECIFICATION (11)

1 346 060

1 346 060

- (21) Application No. 57144/70 (22) Filed 1 Dec. 1970
(23) Complete Specification filed 22 Nov. 1971
(44) Complete Specification published 6 Feb. 1974
(51) International Classification B60N 1/02
(52) Index at acceptance
A4J 246 276 288 300 315 31Y 342 353 384 38Y
(72) Inventors JAMES GERARD FITZGERALD
DAVID JOHN STEVENS

(19)



BEST AVAILABLE COPY

(54) IMPROVEMENTS IN OR RELATING TO AIRCRAFT SEATS

- (71) I, THE SECRETARY OF STATE FOR DEFENCE, LONDON, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—
- This invention relates to aircraft seats, and is concerned with the provision of an improved aircraft seat for aircraft of the type which may normally be flown for at least part of their flight with a nose down pitch displacement from the normal straight and level flight attitude.
- Examples of this type of aircraft are helicopters and aircraft capable of vertical take off and landing.
- In the case of a helicopter, to obtain a maximum forward flying speed, it is usual for the helicopter to be flown with a nose down pitch displacement of up to 15 degrees and this flying attitude is also adopted when a helicopter carries a suspended load. Also, when hovering prior to landing, helicopter pilots commonly hold a nose down pitch displacement of about 15 degrees.
- Similarly, other aircraft capable of vertical take off and landing are brought into land with a nose down pitch attitude as this provides the pilot with an improved view of the landing area.
- With the known type of seat fixed to the aircraft structure the nose down pitch attitude referred to above tilts the pilot forward. This makes the pilot feel that he is falling out of the seat and to counteract this tendency pilots fly with their shoulder straps tighter than normal. This causes the spine, restrained at the shoulder and pelvis region, to try to adopt an arched attitude of hypertension resulting in discomfort and pain.
- According to this invention an aircraft seat has at least one roller to be supported to run along a fixed track on an aircraft, a swinging link mechanism pivotally supported on the seat and to be pivotally connected to aircraft structure, and power operated means for pivoting the swinging link mechanism whereby tilting adjustment when the seat is mounted in an aircraft is provided by pivoting of the swinging link mechanism and movement of the roller along the track.
- The means for tilting the seat may be operable by the pilot and/or automatically.
- For automatic operation, control signals from a pitch sensitive device on the aircraft such as the artificial horizon initiate operation of a power actuator to tilt the seat in the opposite sense to a pitch displacement of the aircraft.
- Tilting of the seat may be in accordance with variation in pitch attitude of the aircraft but for simplicity it is preferable that the seat is moved from a normal datum position to, and held in, a predetermined displaced position following a predetermined nose down pitch displacement of the aircraft and vice-versa.
- An embodiment of the invention is illustrated by way of example in the diagrammatic drawing, as filed with the provisional specification, which is a part-sectional schematic side view.
- As shown helicopter seat has back and base frames 11, 12 and depending support plates one of which is shown at 13. The support plates 13 each carry a roller support 14 which runs on a corresponding track 15 carried on the aircraft structure 16. A pair of swinging links one of which is shown at 17 are pivotally supported at 18 on the aircraft structure and at 19 to the under structure 20 of the seat base frame 12. An electrically operated power actuator 21 is pivotally supported at 22 on the aircraft structure and at 23 to the links 17.
- The seat outline is shown in its normal position for normal flight in full lines. When the pilot intends to fly for a prolonged period in a nose down pitch attitude he operates the power actuator 21. This causes the links 17 to swing to the position shown by chain dotted lines. The roller supports 14 roll along the tracks 15 and the seat is tilted to the position shown in dotted lines. With this embodiment the seat is tilted back this embodiment the seat is tilted back through 10 degrees about an athwartships axis parallel to the aircraft pitch axis.
- Operation of the power actuator 21 may

[Price 25p]

be initiated by a remotely situated switch (not shown), which is conveniently of the three position type spring loaded to an off position and having a position for controlling tilting of the seat in each direction. Such a switch allows accurate adjustment of the seat to suit the pilots comfort. For convenience, and to assist in co-ordination of seat movement with aircraft control during an attitude change the switch is most conveniently positioned on the pilot's right hand control column.

Tilting of the seat may be automatically controlled, for example in response to signals from a pitch sensitive device such as the artificial horizon on the aircraft, which signals are operative to energise the actuator. In such cases and to avoid undesirably frequent tilting of the seat a built in delay may be incorporated whereby the seat is only tilted in response to aircraft pitch changes in excess of say 5 degrees.

Both manual and automatic systems may be incorporated with a selector switch to allow a choice of system.

It should be understood that, although the seat described above has been referred to as the pilot's seat, such seats may be used for any aircraft occupant.

WHAT I CLAIM IS:—

1. An aircraft seat having at least one roller to be supported to run along a fixed track on an aircraft, a swinging link mechanism pivotally supported on the seat and to be pivotally connected to aircraft structure, and power operated means for pivoting the swinging link mechanism whereby tilting adjustment when the seat is mounted in an aircraft is provided for by pivoting of the swinging link mechanism and movement of the roller along the track.

2. An aircraft seat as claimed in claim 1, mounted in an aircraft wherein the power operated means are actuated by an occupant of the seat.

3. An aircraft seat as claimed in claim 2 having actuating means in the form of a switch situated remote from the seat.

4. An aircraft seat as claimed in claim 3 wherein the switch is situated on a pilot's control column.

5. An aircraft seat as claimed in claim 3 or in claim 4 wherein the switch is a three position switch spring loaded to an off position and having a position for controlling tilting of the seat in each direction.

6. An aircraft seat as claimed in claim 1, mounted in an aircraft, wherein the power operated means are actuated automatically by signals from a pitch sensitive device on the aircraft so as to tilt the seat in the opposite sense to a pitch displacement of the aircraft.

7. An aircraft seat as claimed in any one of claims 2 to 5 having additional means whereby the power operated means may be actuated automatically by signals from a pitch sensitive device on the aircraft so as to tilt the seat in the opposite sense to a pitch displacement of the aircraft, and means whereby a seat occupant can select the method of actuation.

8. An aircraft seat as claimed in claim 6 or in claim 7 wherein the pitch sensitive device is an artificial horizon.

9. An aircraft seat constructed and disposed substantially as herein described with reference to and as illustrated in the drawing filed with the provisional specification.

F. R. ROBINSON,
Chartered Patent Agent,
Agent for the Applicant.

(10980)

Printed in Scotland by Her Majesty's Stationery Office
at HMSO Press, Edinburgh, 1974.

Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY,
from which copies may be obtained.

